

Federal Aviation Administration
Civil Aerospace Medical Institute (CAMI)
Human Factors Division
AAM-520

ATCARS ERAM Simulation System Enhancement Program
& Systems Upgrade

STATEMENT OF WORK

May 10, 2011

C.1 BACKGROUND

One of the tools currently used by the Aerospace Human Factors Research Division of CAMI in researching air traffic control human factors is the Air Traffic Control Advanced Research Simulator (ATCARS) lab. ATCARS functionality is comprised mainly of air traffic control workstation simulators provided by Gallium Visual Systems Inc. This simulation includes a full sized surveillance display and computer workstations whereby pseudo-pilots can receive and implement clearances from controller participants for simulated aircraft. ATCARS has been used to research issues related to controller fatigue, the development of situation awareness, and the prevention of the occurrence of operational errors among others. Researching issues such as these requires the ability to simulate the controller's work environment in a controlled laboratory setting. Apart from the ability to control extraneous variables, researching these topics in the lab avoids the ethical and safety concerns related to collecting data in the field. Controller participants are paid to travel to the CAMI location to control simulated air traffic while their behaviors are recorded for later analysis. In this way valuable data is collected while not interfering with actual air traffic operations. It is important that the controller participants become immersed in their control tasks while participating in a simulation so as to increase the likelihood the behaviors we see in the lab are the same as those performed in the field. For this reason and for the validity of the data collected, the simulation must be as realistic as possible.

In 1997, the Aerospace Human Factors Research Division embarked on the development of ATCARS as a high fidelity/highly realistic air traffic simulation suitable for human factors data collection. A computer scientist at CAMI (Dennis Rester) who was familiar with the systems in use in the field at the FAA worked together with programmers at Gallium Visual Systems Inc. The result of the partnership is the I-Sim en route and TRACON air traffic control simulators in use by the ATCARS lab. The simulator has been deployed to air traffic control schools as a training tool and has been in use as a research tool at CAMI for 9 years.

C.2 SCOPE

The intent of this acquisition is to purchase software and hardware, compatible with I-Sim, that will enhance our ATCARS lab capabilities. Specifically, in response to participant comment and in support of our situation awareness measurement technique, it is required that we add the ability to simulate the Voice Communication System (VCS) that is used in the field to our ATCARS lab capabilities. Furthermore, so as to be able to create a large number of scenarios from a wide variety of sectors in a short time, it is required that we add the ability to read Performance Data Analysis Reporting System (PDARS) data to the I-Sim capabilities.

C.2.1 REQUIREMENTS

C.2.1.1 GOVERNMENT RESPONSIBILITIES

The Government will provide information, equipment and access as necessary to complete the tasks contained below.

C.2.1.2 CONTRACTOR RESPONSIBILITIES

The Contractor must provide all services, facilities, personnel, and equipment necessary unless otherwise outlined in the Statement of Work (SOW).

C.2.1.3 GRADE

The contractor will install GRADE software onto the existing ATCARS supervisor position. The contractor will provide:

- GRADE software for PDARS data playback (Microsoft 7 version)
- Installation
- Training on the new ATCARS/PDARS playback capability at site

C.2.1.4 VOICE COMMUNICATION SYSTEM (VCS)

The contractor will use existing computer PC's provided by CAMI to install and deliver the communications software and hardware solution. Communications software will be installed on computers at each of the following positions:

- 8 Pseudo Pilot Positions
- 4 R-Side Controller Positions
- 4 D-Side Controller Positions
- Supervisor Position

The contractor will provide the following:

- Touch Screens: All positions will have touch panels which emulate FAA systems
- Foot pedals will be provided for all positions and fully integrated to the communication system enabling hands-free operation.
- Headsets with integral microphones and push-to-talk switches will be provided as part of the VCS, one (1) for each VCS position.
- Speaker panels with integrated volume control will be provided for each position.
- Each position will have a communications jack box, and each box will accept two (2) headset inputs. This will enable an instructor or another student to plug into the communications panel and listen to all transmissions and discussions.

- CONNECT ATC Simulator software (Microsoft 7 version)
- Installation
- Training at site

C.2.1.5 OPTIONAL ACCESSORIES

Four (4) each of the following:

- En-route Keypad
- DSR Trackball
- DSR keyboard
- ARTS keyboard

C.3 DELIVERY SCHEDULE

Key Milestones

GRADE	July 29, 2011
VCS	July 29, 2011
Accessories	July 29, 2011

C.4 DELIVERABLES

C.4.1 GRADE

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C.4.2 VOICE COMMUNICATION SYSTEM (VCS)

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- Speaker panels with integrated volume control will be provided for each position.
- Each position will have a communications jack box, and each box will accept two (2) headset inputs. This will enable an instructor or another student to plug into the communications panel and listen to all transmissions and discussions.
- CONNECT ATC Simulator software (Microsoft 7 version)
- Installation
- Training at site

C.4.3 OPTIONAL ACCESSORIES

Four (4) each of the following:

- En-route Keypad
- DSR Trackball
- DSR keyboard
- ARTS keyboard

C.5 GOVERNMENT FURNISHED SUPPORT, EQUIPMENT AND MATERIALS

The Government will provide the following equipments and materials upon contract award.

- The FAA CAMI will provide all consoles.
- The FAA CAMI will be responsible for modification to the consoles to ensure proper installation of equipment.

- The FAA CAMI will be responsible for modifications to existing computer equipment to ensure proper installation (including sound cards and display cards).
- The FAA CAMI will provide all required electrical power requirements to support the system.
- FAA CAMI will provide required suitable environmental conditions to operate the system. This includes space, and air conditioning, and room lighting, and room ventilation.
- FAA CAMI will provide a single point of contact that will function as the project manager (FAA CAMI's representative) for the duration of the project.
- FAA CAMI will support the installation of the simulation systems with their appropriate technical and IT personnel as required during the installation and system commissioning. The FAA CAMI's personnel who receive the system training are expected to be technically qualified as appropriate (IT or ATC backgrounds, as required) to ensure full understanding of all training course material.
- In support of scenario creation, FAA CAMI will obtain FAA approval to use PDARS data and the installation of appropriate data transfer components on the PDARS system has been completed.

C.6 SECURITY

The Contractor must comply with all installation pass requirements.

C.6.1 GENERAL DEFINITIONS

- A. Acceptable Quality Level (AQL)** The standard at which service is considered satisfactory as agreed upon by the Contractor and the Government.
- B. Alternative Dispute Resolution (ADR)** Process for the resolution of disputes regarding work determined to be unsatisfactory.
- C. Contractor** – The term Contractor as used herein refers to both the prime Contractor and any subcontractors. The prime contractor shall ensure that his subcontracts (if any) comply with the provisions of this contract.
- D. Contracting Officer (CO)** – One with authority to enter into, administer, and/or terminate contracts and make related determinations.
- E. Contracting Officer Technical Representative (COTR)** – One who is designated and authorized in writing by the CO to be responsible for surveillance/monitoring of the Contractor's performance.
- F. Contractor Owned Property** – All property used on this contract that is owned or furnished by the Contractor.

- G. Contractor's Representative** – An Project Coordinator assigned by the Contractor to manage the services outlined in the SOW.
- H. Customer Comments** – A means for end users to provide comments pertaining to services provided by the contractor.
- I. Government Owned Property** – All property owned by or leased to the Government or acquired by the Government under the terms of the contract. Government property included both Government-furnished property and Contract acquired property as defined in AMS Guidance T3.10.3.
- J. Quality Assurance (QA)** – Those actions taken by the Government to assure services meet the acceptable quality level established by the contract between the Contractors and Government.
- K. Quality Assurance Surveillance Plan (QASP)** – An organized written, “living”, document outlined the Government’s methodology for monitoring contractor performance.
- L. Quality Control (QC)** – Those actions taken by the Contractor to ensure contractor performance meets the requirements of the contract.

C.6.2 Acronyms:

(AMS) Aviation Management System
(CAMI) Civil Aerospace Medical Institute
(CO) Contracting Officer
(COTR) Contracting Officer Technical Representative
(En Route) Air traffic control for cruise phase of flight provided by radar controllers working at Air Route Traffic Control Centers
(FAA) Federal Aviation Administration
(FAR) Federal Aviation Regulation
(QC) Quality Control
(QA) Quality Assurance
(SOW) Statement of Work
(TRACON) Terminal Radar Approach Control

C.9 QUALITY CONTROL

Quality Control: The contractor shall develop a quality control plan to assure that development of the simulator provided under this contract is ISO 9001 compliant or meets Industry Standards.

1.8.2 Quality Assurance: The Government will monitor the contractor's performance under this contract. Performance shall be considered acceptable when it meets requirements contained in the contract and SOW.

C.10 OVER AND ABOVE SERVICES

Over and Above Services are those services required to support the production of the NFD that are unknown at this time, not explicitly defined above, but necessary in support of the new and evolving requirements and/or that impact the usefulness of the Simulator.

C.11 TRAVEL

The FAA COTR/CO may request performance from the contract personnel that results in travel. All travel requests shall be provided in writing from the CO with authorization and reference to available travel funds for the contract line item. Travel expenses are paid according to FAA Travel Regulations.